UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,990	08/26/2003	Jin-Aeon Lee	8021-170 (SS-19644-US)	2486

22150	7590	09/14/2006

F. CHAU & ASSOCIATES, LLC
130 WOODBURY ROAD
WOODBURY, NY 11797

EXAMINER
CONNOLLY, MARK A

ART UNIT	PAPER NUMBER
2115	

DATE MAILED: 09/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/647,990	LEE ET AL.
	Examiner	Art Unit	
	Mark Connolly	2115	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>05 July 2006</u>.

2a) ☒ This action is **FINAL.**   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-35</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-7,9-12,14-21,23-26,28,29,31 and 33-35</u> is/are rejected.

7) ☒ Claim(s) <u>8,13,22,27,30 and 32</u> is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-35 have been presented for examination.

2.   Applicant's arguments with respect to claim1-33 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 1-6, 29, 31 and 33 rejected under 35 U.S.C. 103(a) as being unpatentable over Dai US Pat No 6738675.

5.   Referring to claim 1, Dai teaches the invention substantially including:

a.   selecting a power-off standby mode [col. 1 lines 35-45].

b.   transmitting a working context with respect to at least one hardware module mounted on a chip to a predetermined memory, and storing the working context in the predetermined memory [col. 4 lines 30-35].

c.   transmitting the working context stored in the predetermined memory to a memory outside the chip, and storing the working context in the outside memory [fig. 3 and col. 4 lines 22-35].

d.   executing the power-off standby mode [col. 4 lines 30-35].

Although Dai suggests the external memory as being a self suspend RAM or second cache, it is not explicitly taught that the external memory is non-volatile. Dai does openly admit

the importance on reducing power consumption. With that in mind, Dai only teaches two power

consumption modes: high power dissipation state and low power dissipation state. Even when

Dai is in a low power dissipation state, it is still necessary to supply power to the context

memory when removing power from the core in order to preserve the context even if the system

remains idle or unused for an extended period of time. Wong-Insley teaches a means to conserve

additional power by storing context in a non-volatile memory [col. 11 lines 10-47]. In particular,

Wong-Insley teaches a sleep state wherein the context must be stored in a "self-refresh" or

"battery-backed RAM" or in other words, a power mode wherein power is still required to

maintain context information. This power mode is interpreted as being similar to the low power

dissipation state in Dai since the processors in both systems do not operate and power is required

to preserve context. Wong-Insley further teaches a suspend state which consumes even less

power than the low power dissipation state and sleep state above. By storing context information

into non-volatile memory, power to the CPU and memory can be removed completely. It would

have been obvious to one of ordinary skill in the art to include the teachings of Wong-Insley into

the Dai system because it would provide a means for Dai to conserve additional power. It is

obvious that Dai could be modified by either backing the context from the SSRAM or second

cache into non-volatile memory or by replacing the SSRAM or second cache with a non-volatile

memory.

Although the Dai – Wong-Insley system does not explicitly teach a system-on-a-chip

(SOC) the examiner is taking official notice that SOC design is an extremely well known

concept in the art that integrates a plurality of system components into a single chip. SOC design

provides benefits over previous non-SOC designs, which include greatly reducing the size and

cost of the system in addition to reducing its power consumption. It would have been obvious to one of ordinary skill in the art at the time of the invention to realize the teachings of Dai and Wong-Insley in SOC designs because it would provide a means to place an SOC system into very low power states.

6.   Referring to claim 2, Wong-Insley teaches that when the system wakes up it returns to its previous execution state [col. 13 lines 25-32].

7.   Referring to claim 3, NAND and NOR flash memories are well known in the art and it would have been obvious by design choice to use either as the non-volatile memory.

8.   Referring to claim 4, Dai teaches that the second cache or SSRAM is outside the semiconductor chip [fig. 3].

9.   Referring to claim 5, Dai teaches that the power to the processor core is disconnected [col. 4 lines 22-35].

10.   Referring to claim 6, Dai teaches returning the processor core to its operating state [270 fig. 2C and col. 5 lines 41-54].

11.   Referring to claims 29, 31 and 33, these are rejected on the same basis as set forth hereinabove. Dai and Wong-Insley teach the method and therefore teach the system performing the method.

12.   Referring to claim 34, Wong-Insley teaches removing power from the non-volatile memory [col. 11 lines 35-43].

13.   Claims 7, 9-12, 14-21,23-26 and 28 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Dai and Wong-Insley as applied to claims 1-6, 29, 31 and 33 above, and

further in view of Tobias et al [Tobias] US Pat No 6363501.

14.   Referring to claim 7, Dai and Wong-Insley teach a system comprising a microprocessor

which can store a working context in non-volatile memory during a power-off standby mode.

Although the Dai - Wong-Insley system teaches preserving microprocessor context, it is not

explicitly taught to preserve the context of at least one hardware module in addition to context of

the microprocessor. Tobias teaches integrating a plurality of devices into a single chip and

placing the single chip into a suspend mode by storing all context data to external memory [col. 1

lines 9-40, col. 5 lines 58-60 and col. 7 lines 3-9]. Because an SOC device using the power

conserving techniques above comprise a plurality of devices all integrated into a single chip

similar to that described in Tobias, it would have been obvious to one of ordinary skill in the art

at the time of the invention to modify the Dai – Wong-Insley system to include the teachings of

Tobias because Tobias teaches the need to preserve all context data before entering a suspend

state and powering down. By preserving all context data into the non-volatile memory taught in

Wong-Insley, it would provide the system the ability to completely remove power from the SOC

since all context data would be safely preserved thus providing an optimal amount of power

savings.

15.   Referring to claim 9, Dai teaches an on-die logic circuit integrated into the processor that

controls power to the microprocessor [col. 4 lines 5-9]. It is interpreted that since the

preservation of the context data is directly dependent upon the power state of the core, that the

on-die logic circuit would also have control over saving the context data.

16.   Referring to claims 10-12, 14-21, 23-24 these are rejected on the same basis as set forth

hereinabove.

17.   Referring to claim 25, the on-die logic circuit in Dai which controls power and operation

as stated above is interpreted as the at least one hardware module.

18.   Referring to claims 26, 28 and 35, these are rejected on the same basis as set forth

hereinabove.

Allowable Subject Matter

19.   Claims 8, 13, 22, 27, 30 and 32 are objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of the limitations of

the base claim and any intervening claims.

Conclusion

20.   Applicant's amendment necessitated the new ground(s) of rejection presented in this

Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Connolly whose telephone number is (571) 272-3666. The examiner can normally be reached on M-F 8AM-5PM (except every first Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas C. Lee can be reached on (571) 272-3667. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Mark Connolly
Examiner
Art Unit 2115

mc
September 5, 2006

CHUN CAO
PRIMARY EXAMINER